



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/591,298	05/31/2007	Shinichi Wada	L5085.07120	9228
52989 7590 10/30/2008				
Dickinson Wright PLLC				
James E. Ledbetter, Esq.				
International Square				
1875 Eye Street, N.W., Suite 1200				
Washington, DC 20006				
EXAMINER				
KIM, JOHN K				
ART UNIT		PAPER NUMBER		
2834				
MAIL DATE		DELIVERY MODE		
10/30/2008		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/591,298

Applicant(s)

WADA ET AL.

Examiner

JOHN K. KIM

Art Unit

2834

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 August 2008.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 and 7-14 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-5 and 7-14 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 29 August 2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SF-08)
Paper No(s)/Mail Date 8/31/2008
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

1. This Office action is in response to papers filed on 29 August 2008. Amendments made to the claims and Applicant's remarks have been entered and considered.
2. Claims 1-5 and 7-14 are pending and are presented for examination. Claims 1 has been amended, claim 6 has been cancelled and claims 13-14 have been newly added.

Response to Arguments

3. Applicant amended claim with new limitations and therefore arguments moot.

Response to Amendment

4. The examiner reviewed amended claims and remarks as follows.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.

3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
6. Claims 1-3, 7-9 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyamoto (US 2003/01478904) in view of Higuchi (US 6339273) and in further view of Kakegawa et al (US 2005/0052088).

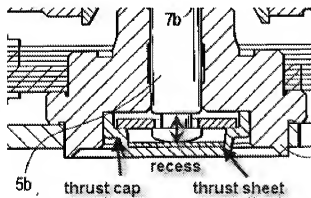
As for claim 1, Miyamoto teaches (in Fig. 1) a disk apparatus comprising: a rotor frame (17) in which a disk holding member (23) is placed on a center of an upper surface of said rotor frame (17); a shaft (7) mounted on a center of said rotor frame; a bearing metal (9) which holds said shaft; a holder (5) which is disposed on an outer periphery of said bearing metal and which holds said bearing metal; a stator (15) disposed on an outer periphery of said holder; a magnet (19) fixed to said rotor frame at a location opposed to said stator; and a thrust cap (11) fixed to a center of a lower portion of said holder, in which an outer periphery of the lower portion of said holder is fixed to a motor plate (1), and said shaft (7) is disposed between said disk holding member (23) and said thrust cap (11), wherein: said rotor frame (23) at the location (17c) opposed to said bearing metal is projected toward said disk holding member, thereby forming a bearing metal space in a lower portion of a center of said rotor frame (23), and an upper end of said bearing metal (9) is brought closer to said rotor frame, said rotor frame (17) has a cylindrical portion (17c), an inner peripheral plate (inside 17a) adjoined to the cylindrical portion (17c), a step portion (17a) adjoined to the inner peripheral plate, and an outer peripheral plate (17b by 21) adjoined to the step portion,

the inner peripheral plate is concentrically connected to the outer peripheral plate (17b) via the step portion (17c). Miyamoto however failed to teach said bearing metal space is formed by forming a surface constituting said rotor frame into a step shape in a manner that said bearing metal space is surrounded with the inner peripheral plate, the step portion and said bearing metal, and a size of said bearing metal space in its radial direction is greater than a size of said bearing metal in its radial direction, and a thickness of the inner peripheral plate is thinner than that of an entire extent of the outer peripheral plate. In the same field of endeavor, Higuchi teaches (in Figs. 1 and 4) bearing metal space is formed by forming a surface constituting said rotor frame (1) into a step shape (at numeric 7e and 21) in a manner that said bearing metal space is surrounded with the inner peripheral plate (7), the step portion and said bearing metal (5a), and a size of said bearing metal space in its radial direction is greater than a size of said bearing metal (5a) in its radial direction, and a thickness of the inner peripheral plate is thinner than that of an entire extent of the outer peripheral plate.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teaching of Higuchi with that of Miyamoto for enhanced lubrication. (col. 8, line 61-65). Higuchi however failed to teach a thickness of the inner peripheral plate is thinner than that of an entire extent of the outer peripheral plate. In the same field of endeavor, Kakegawa teaches (in Fig. 1) a thickness of the inner peripheral plate (11 at central) is thinner than that of an entire extent of the outer peripheral plate (11 at outer). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teaching of

Kakegawa with that of Miyamoto and Higuchi as an obvious matter of design choice for optimization, and since such a modification would have involved a mere change in the size of a component. A change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955).

As for claim 2, Miyamoto, Higuchi and Kakegawa teach the claimed invention as applied to claim 1 above. Higuchi further teaches (in Fig. 1 and sketch below) a recess is formed in thrust cap at a location opposed to shaft (5b).



As for claim 3, Miyamoto, Higuchi and Kakegawa teach the claimed invention as applied to claim 2 above. Higuchi further teaches (in Fig. 1 and sketch above) a protrusion is formed on a center of a lower end surface of shaft (5b), and a protrusion projecting toward said shaft (5b) is formed on a center of the recess of thrust cap at a location opposed to said shaft (5b).

As for claim 7, Miyamoto, Higuchi and Kakegawa teach the claimed invention as applied to claim 2 above. Higuchi further teaches a coating with fluorine for smooth circulation of lubrication oil into the bearing. (col. 8, line 61-65). Higuchi,

however, failed to teach the coating is applied on an upper surface of the recess of said thrust cap or a lower end surface of said shaft. However, it is notoriously old and well known in the art to apply lubrication on those rotational friction spots, and therefore the examiner hereby takes official notice regarding the location of the fluorine coating. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to improve the circulation of lubrication.

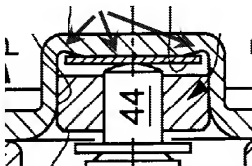
As for claim 8, Miyamoto, Higuchi and Kakegawa teach the claimed invention as applied to claim 1 above. Higuchi further teaches or suggests (in Fig. 4) a recess (at 4a below 4d) is formed in a motor plate (4a) at a location corresponding to a convex portion of an insulator of a coil (4d) constituting stator (4).

As for claim 9, Miyamoto, Higuchi and Kakegawa teach the claimed invention as applied to claim 1 above. Fukutani further teaches (in Fig. 1) a thickness of a projection (16) of rotor frame (2) located above bearing metal (5) is made thinner than a basic thickness of rotor frame (2). Projection of rotor frame by drawing or crushing operation is a product by process limitation whose patentable weight is very little.

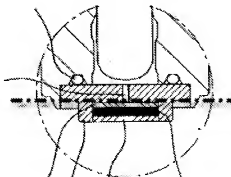
As for claim 13, Miyamoto, Higuchi and Kakegawa teach the claimed invention as applied to claim 1 above. Higuchi further teaches (in Figs. 1 and 4) the step portion (at numeric 21) is formed into declined shape.

7. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyamoto (US 2003/01478904) in view of Higuchi (US 6339273) and Kakegawa et al (US 2005/0052088), and further in view of Shiraki et al (US 6465927).

As for claim 4, Miyamoto, Higuchi and Kakegawa teach the claimed invention as applied to claim 2 above. Higuchi further teaches (in Figs. 1 and 4) a lower end surface of shaft (5b) is formed into a spherical shape, thereby forming protrusion but failed to teach an upper surface of the recess of thrust cap is formed into a spherical shape, thereby forming protrusion. In the same field of endeavor, Shiraki teaches (in Fig. 1, see arrow in sketch below left) an upper surface of the recess of thrust cap (30) is formed into a spherical shape, thereby forming protrusion. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to make the shape of protrusions at the lower end of the shaft and the thrust cap by combining the teachings of Shiraki with those of Miyamoto, Higuchi and Kakegawa for constant contact (col. 3, line 20-26), and as an obvious matter of design choice for optimization, and since such a modification would have involved a mere change in the size of a component. A change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955).



Sketch claim 4



Sketch claim 5

8. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyamoto (US 2003/01478904) in view of Higuchi (US 6339273) and Kakegawa et al (US 2005/0052088), and in further view of Kim (US 2004/0032176).

As for claim 5, Miyamoto, Higuchi and Kakegawa teach the claimed invention as applied to claim 2 above. None of above prior arts, however, teaches a lower end surface of said thrust cap by said recess has the same height as that of a lower end surface of the swaging portion of the thrust cap of said holder. In the same field of endeavor, Kim teaches (in Fig. 3) a lower end surface of cap (16) by recess has the same height as that of a lower end surface of the swaging portion of the cap of holder. (see bold dash line in sketch below) Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to make the bottom recess height same as the lower end surface of the swaging portion of thrust cap by combining the teachings of Kim with those of Miyamoto, Higuchi and Kakegawa to reduce lubrication leakage [0013], and as an obvious matter of design choice for optimization, and since such a modification would have involved a mere change in the size of a component. A change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955).

9. Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyamoto (US 2003/01478904) in view of Higuchi (US 6339273) and Kakegawa et al (US 2005/0052088), and in further view of Obara (US 6538354).

As for claims 10 and 11, Miyamoto, Higuchi and Kakegawa teach the claimed invention as applied to claim 1 above. References, however, failed to teach an outer side of motor plate being projected toward rotor frame. In the same field of endeavor, Obara teaches or suggests (in Fig. 1a) a side of motor plate (2) located outside from an outer periphery of rotor frame (5) is projected toward said rotor frame. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to project an outer side of motor plate toward rotor frame by combining the teachings of Obara with those of Miyamoto, Higuchi and Kakegawa to reduce the thickness of disk driver by mounting the motor at above the motor bottom.

10. Claims 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyamoto (US 2003/01478904) in view of Higuchi (US 6339273) and Kakegawa et al (US 2005/0052088), and in further view of Karidis (US 4712027).

As for claim 12, Miyamoto, Higuchi and Kakegawa teach the claimed invention as applied to claim 1 above. Fukutani, however, failed to teach rotor frame is subjected to nitrogen processing. In the same field of endeavor, Karidis teaches or suggests rotor frame is subjected to nitrogen processing. (col. 9, line 50-57) Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to perform nitrogen process for the rotor frame by combining the teachings of Karidis with that of Miyamoto, Higuchi and Kakegawa for homogenous surfaces. (col. 3, line 49-54)

11. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyamoto (US 2003/01478904) in view of Higuchi (US 6339273) and in further view of Kakegawa et al (US 2005/0052088).

As for claim 14, Miyamoto teaches (in Fig. 1) a motor for holding a disk, said motor comprising: a shaft (7) that rotates; a bearing (9) that holds outer periphery of the shaft; and a frame (17) that contains both the shaft and the bearing and that has an inner peripheral plate (inside 17a), a step portion (at 17a) and an outer peripheral plate (17b and under 21), the inner peripheral plate being concentrically connected to the outer peripheral plate via the step portion (17a). Miyamoto however failed to teach a bearing space is formed by forming a surface constituting said rotor frame into a step shape in a manner that the bearing space is surrounded with the inner peripheral plate, the step portion and the bearing, and a size of the bearing space in its radial direction is greater than a size of the bearing in its radial direction, and wherein a thickness of the inner peripheral plate is thinner than that of an entire extent of the outer peripheral plate. In the same field of endeavor, Higuchi teaches (in Figs. 1 and 4) bearing metal space is formed by forming a surface constituting said rotor frame (1) into a step shape (at numeric 7e and 21) in a manner that said bearing metal space is surrounded with the inner peripheral plate (7), the step portion and said bearing (5a), and a size of said bearing metal space in its radial direction is greater than a size of said bearing metal (5a) in its radial direction, and a thickness of the inner peripheral plate is thinner than that of an entire extent of the outer peripheral plate. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to

combine the teaching of Higuchi with that of Miyamoto for enhanced lubrication. (col. 8, line 61-65).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **JOHN K. KIM** whose telephone number is (571)270-5072. The fax phone number for the examiner where this application or proceeding is assigned is 571-270-6072. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Quyen Leung can be reached on 571-272-8188.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tran N. Nguyen/

Primary Examiner, Art Unit 2834

JK